tz76

Grace (Tianyi) Zhang's Individual Contribution Page

Spring 2017 Contributions

My name is Grace and I'm a new member who just joined the Rapid Mix Contact Chamber team of AguaClara during the spring 2017 semester. This semester our team focused on testing the hypothesis that coagulant deposition onto the walls of the flocculator will increase headloss, the addition of clay can potentially reduce the increase of headloss, and having contact chamber can reduce the headloss and thus increase the efficiency of coagulant.

As a freshman, I continue learning about the background knowledge needed to understand the chemical and physical principles behind the experiment and the programs we needed for data analysis. I helped build the apparatus for our experiment, figuring out how to replicate last semester's team's experiment while adding clay solution to the system. After we have the apparatus ready, we ran multiple experiments with and without clay solution of different concentrations and with different flow rate. We have to constantly change the pump rate of three pumps based on the mathcad file in order to get the desired flow rate. Our conclusion is that the coagulant does attach to the wall, which means the tube flocculator can work as a detector of free coagulant, and with the current system the clay does not help remove coagulant from the walls of the flocculator. We moved on to design new contact chamber and flocculator and I helped during the design and fabrication process. We increased the surface area ratio of clay particles by increasing the diameter of the contact chamber so that there's higher probability for coagulants to attach to the clay particles. We found that the new contact chamber does significantly lower the rate of increase of the headloss. We also built a coiled flocculator with desired headloss and ran experiments with different combinations of flow rates and turbidities.